

Can Acupuncture of the Tongue help Autism?

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There is an ancient Chinese belief:

"One tonifies a disease with similar remedies e.g. kidney of a pig for an kidney problem; and the brain of a pig for a brain disorder etc. Thus, by acupuncture of the tongue, can we improve communication ???..."

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"It may not sound like the most pleasant therapy, but tongue acupuncture is attracting attention from parents of children with chronic disabilities in Hong Kong and world-wide. It is being studied for treating brain disorders in children, ranging from cerebral palsy to autism to blindness."

"Strange enough, and to our surprise, children are more tolerant of this 'painful and yet seemingly painless' technique, especially for the autistic. One just wonders whether it is the purism of heart or the relative higher pain threshold of these beautiful yet lonely children that paved their way for forever improvement..."

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Autism or Autistic Spectrum Disorder (ASD) is a behaviorally defined, lifelong disorder of the brain. Although it is one of the most common neurodevelopmental disorders in children, its cause is still a mystery, and no cure is currently available. Autism is characterized by deficits in language, social communication and cognition. The basis of the disorder may be neurochemical (serotonin or dopamine neuronal dysfunction), neurobiological (genetic basis), or neuropsychological (dysfunction of complex information processing or theory of mind). Children with autism usually have secondary problems in behaviour including aggression, irritability, stereotypies, hyperactivity, negativism, volatile emotions, temper tantrums, short attention span and obsessive-compulsive behavior. Direct and indirect evidence suggests that neurochemical systems might be relevant in understanding the pathogenesis of autism.

We are witnessing a worldwide increase in the incidence of autism. Rates of 10-15 per 10,000 used just a few years ago are being replaced with new rates of 40-60 per 10,000 individuals. There has been an increasing trend of autism in Asians and Caucasians recently. Therefore, an urgent need exists for developing new intervention strategies that may be useful for this population.

How Traditional Chinese Medicine (TCM) views Autism

The Chinese translation of Autism is "Self-Shut-Off Syndrome" in Hong Kong and Taiwan. However, in People's Republic of China, it is known as the "Lonely Syndrome". However, in TCM, no such disease called Autism exists. TCM doctors approach health and disease according to the philosophy of "Yin-Yang", which encompasses "balance and the homeostasis of the universe" and the "5 elements" (gold, wood, water, fire and soil). They also believe in the phenomenological and empirical observations of "Qi, Blood and the 8 Principles". TCM

practitioners differentiate "syndrome" according to 8 principles; Qi and Blood or according to the theory of "Zang-Fu organs". The pathogenesis of disease is based on disharmony of Yin and Yang, conflicts between "antipathogenic Qi" and "Pathogenic Qi"; or the abnormal descending or ascending Qi. Qi is the 'life energy' that flows through the entire body. The 8 principles involve Exterior/Interior, cold/heat, deficiency/excess, and yin-yang. This philosophy is based on more than 5,000 years of cumulative experience of human physiology and pathophysiology.

The etiology of disease, in TCM concept, can include 6 exogenous factors (wind, cold, summer heat, dampness, dryness, fire) and 7 emotions (joy, anger, melancholy, worry, grief, fear and fright), together with improper diet, overstrain, lack of physical exercise, stagnated blood and phlegm fluid. In the western concept, this may affect the body's immune defence system.

A TCM diagnosis has four components: Inspection, auscultation /olfaction, Inquiring, and palpation. TCM doctors For inspection, one looks at the vitality, colour, appearance, observe the 5 sense organs (eye, nose, ear, gums, lips/mouth, throat), and observe the tongue. For auscultation, one listens and smells. By inquiring, one asks leading and relevant questions that address "heat versus cold", "inside versus outside" and "strong versus weak", and for palpation, one feels the pulse qualitatively (not according to the western methodology) and palpates other parts of the body. Integrating these 4 components with knowledge of "zang-fu" (the organ system) and "jing-luo" (the meridian system) helps the TCM doctor make a 'Syndromal diagnosis" and develop a treatment based on TCM methodologies. Treatment choices include herbal medicine, natural medicine, acupuncture, Acu-Tuna or acu-massage.

Traditionally in TCM, all children with mental retardation, cerebral palsy, autism, global developmental delay or delayed language development are grouped under the "Syndrome of 5-Delays". This Syndrome is based on observed delays in hair growth, teeth eruption, speech, standing and walking. In the TCM concept, brain dysfunction in children is a dysequilibrium of body functions. The TCM approach is a "holistic" approach, firmly rooted in the Yin-Yang theory; disease is viewed within the framework of a "Balance of Energy".

Acupuncture

Acupuncture has been practiced in Traditional Chinese Medicine (TCM) for over 2,000 years. In 1997, the Food & Drug Administration (FDA) in the USA recognized the legal status of acupuncture as a treatment technique, and since that time several other countries including Canada, the United Kingdom and several in Europe, have also done so. Research studies have now proven the benefits of acupuncture in treating pain and disorders of the brain.

Acupuncture uses very thin needles, as thin as a hair on your head [VIRGINIA: IS THIS AN ACCURATE ANALOGY?] which are inserted into targeted points in the body called acupoints. There are more than 400 acupoints in the body, linked through a system of 14 meridians, or pathways. Acupoints are rich in nerve terminals, and when stimulated, result in activation of both the local point and other, more distant points in the body that fall along the same meridian. Their stimulation may result in neural signaling, electromagnetic energy enhancement, neuro-immunomodulatory and neurochemical-hormonal effects.

The therapeutic effect of acupuncture depends on the acupoint(s) selected and the type of stimulation used. Body acupuncture, electrical acupuncture, laser acupuncture, and even acupressure have been practiced. Traditional acupoints on the scalp and body (by manipulation and electrical) have been found effective for treating children with brain dysfunction, resulting in improvement in the patient's overall functional abilities.

Tongue Acupuncture

Tongue diagnosis is an important part of the clinical diagnostic examination in Traditional Chinese Medicine for

a syndromal approach such as autism. The tongue is the only body organ which can be exposed and seen externally. By looking at its color, thickness, dryness, superficial growth, and smell, TCM doctors can determine a treatment based on the eight principles. Moreover, according to TCM, the tongue reflects the condition of the heart, which is the 'master organ', controlling all the other internal organs. Thus indirectly, the tongue is linked by meridians to all the organs of the body.

Tongue Acupuncture (TAC) is an innovative acupuncture technique invented by my team collaborator, Dr. Sun JG from China. It is based on one of the most ancient medical books in China, *Wang Di's Internal Medicine*, and the idea that the tongue is the intersection site of all 14 meridians in the human body. Dr. Sun discovered that the tongue contains more than 40 acupoints. We hypothesize that there is a 'Human Map' in our tongue, which is connected via rich neural-vascular pathways inside the tongue to different regions of the brain, especially the cerebellum. Neuroimaging with PET and functional MRI has demonstrated the possible role of the cerebellum and other brain region dysfunction with ASD. The cerebellum can be viewed as having its own internal topography, one that is directly linked to the modulation of emotions and social behavior, thought, language and the ability to plan. Is autism part of the system dysfunction of the cerebellum and its connecting pathways?

In our research, we had been encouraged by the positive results in two normal subjects in the areas of language and visual processing, after a short course of TAC. We decided to conduct further research to test how TAC might affect the cerebellum [cognition], temporal lobe [language], frontal lobe [executive function and affect] and basal ganglia [ritualistic/stereotypic mannerisms]. This was done through monitoring changes in glucose metabolism, via a PET scan. The use of Brain FDG-PET in the integration of Western-Chinese Medicine is essential to scientifically assess Alternative Medicine strategy for neurobiological diseases from a functional outcome perspective.

Research Phases of Tongue Acupuncture (TAC)

In March 1999, we launched a pioneer research program in integration of TCM with WM into our Neuro-Habilitation model for children with various forms of brain disorders. More than 700 children with various neuro and/or developmental disabilities were enrolled in the research program, of which about 250 cases involved children with autism.

TAC was given to specific tongue acupoints daily (5 days per week) for 1-2 courses (each course lasted for 4 weeks. (Total = 20-40 sessions). The tongue acupoints were determined by Dr Sun, based on his experience of the TCM approach of the "Syndrome of 5 Delays". We began by looking at individual cases and studying the daily written reports completed by the child's mother that described the child's progress after each TAC sessions. As we were also interested in assessing the long-term efficacy of TAC, children with noted improvement after two completed courses were offered the option of further courses, at the parents' requests and depending on the degree of clinical improvement.

Our pilot control study of 30 children with autism using TAC demonstrated improvement in core features (language, social communication, cognition) and secondary features (hyperactivity, attention, aggression, temper tantrum, sleep, functional independence).

As TAC had been introduced in this study as a new acupuncture technique (level 3 evidence), our next step was to proceed to Randomized Control Trials and Double Blind Randomized Placebo Control trials (TAC versus Sham TAC) to produce Level 1 evidence. These studies were conducted for Autistic Spectrum Disorder and Cerebral Palsy children.

The majority showed functional improvement of various degrees, depending on the age and severity of their disabilities. Some improvement was noticeable within a few TAC sessions, especially for drooling, spasticity

(scissoring or tiptoeing), ataxia, and poor balance in walking. Functional improvement was noted after one to two courses of TAC. Most children tolerated TAC well, with only occasional pain and minor bleeding in some patients.

What's Unique About Tongue Acupuncture and Autism?

In a revolutionary new treatment, our research team has demonstrated for the first time in a clinical trial how acupuncture can successfully improve the dysfunction related to autism, by activating vital connections in the brain. We hypothesize that repetitive stimulation of specific tongue acupoints can reconnect the neural circuit through its rich neural network to the cerebellum. Improvement may result through the resignaling of the neural circuits via neurotransmitters, like serotonin/5-HT, dopamine and neurochemicals like cortisol. This reconnection of the cerebellar-frontal-temporal circuits may reverse the basic dysfunctional pathways in autism, including attention, emotion, or hyperactivity, and open up a positive road for learning communicative or cognitive skills. Once the "latent" brain is reactivated again, the use of intensive therapeutic interventions (such as speech, occupational therapy and behavioral therapy) and education can help children process information in a more efficient way.

Future Direction

Many questions remain yet unanswered. Alternative treatment strategies, such as TAC, should be viewed as a complementary approach in neurological disabilities. However, an interdisciplinary approach involving Western and Chinese medicine provides an innovative starting point for a new conceptual treatment framework for autism. If we can demonstrate the topography of the brain with concordant tongue acupoints, this research will play an important role in developing a potential paradigm shift as to the pathogenesis of autism and neural plasticity.

TAC can be viewed as a "START-UP" program or adjunctive therapy for autism. We hope that we can use a simple, relatively non-invasive quick treatment strategy to benefit families with autism worldwide.

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Acknowledgement:

I would like to thank deeply all the lovely disabled children and supportive parents who actively participated, with bravery and enthusiasm, in this innovative and yet unexplored research program. Without them, it would be difficult to sustain my initial enthusiasm for the Integration of Traditional Chinese Medicine and Western Medicine. The pressure was heavy; but, seeing the cheerful faces of my children and their grateful parents over the last three years, helped me to pursue for research for new treatment modalities for all those who suffered from AUTISM.

DR JG Sun, who performed the acupuncture (Tongue Acupuncture inventor and research collaborator).

1916 words

References:

1. V Wong, KW Chiu, NY Chun. Multimodal Therapeutic Strategy including Acupuncture for Acute Facial Nerve Palsy in a Child. *Proceedings of Advances in Chinese Medicine* 1998 June; 43.
2. V Wong. Pilot Study of Traditional Herbal Medicine in Children with Neurodevelopmental Disorder. *Proceedings of 2nd Meeting of International Research Program on Traditional Chinese and Natural Medicine, Beijing, China (12-14 March, 1999)*

3. V Wong. Integration of Traditional Chinese Medicine (Tongue Acupuncture and Traditional Chinese & herbal Medicine) in Neurohabilitation Program in child neurology practice. Proceedings of 9th National Child Neurology Meeting in Wanzhou, PRC. 1999 May 24-28.
4. V Wong. Integration of Traditional Chinese Medicine (Tongue Acupuncture and Traditional Chinese & herbal Medicine) in Neurohabilitation Program in child neurology practice. Proceedings of 1st International Research Program of Traditional Chinese & Herbal Medicine in Beijing, PRC. 1999 Sept
5. V Wong, JG Sun, Q Ma, E Yang. Tongue Acupuncture in Child Neurology Practice - a New Neurohabilitation model? Proceedings of 6th Asian & Oceanian Child Neurology Congress and 21st Annual Congress of the Malaysian Paediatric Association in Malaysia. 1999 Sept 5-8. (Best presentation)
6. V Wong, JG Sun, Q Ma, E Yang. Tongue Acupuncture in Child Neurology Practice - a New Neurohabilitation model? Proceedings of Asian & Oceanian Neurology Congress in Philippines. 1999
7. V Wong, JG Sun, Q Ma, E Yang, CY Yeung, R Li. Use of Traditional Chinese Medicine (Tongue Acupuncture) in children with neurological disorders. Pilot study of 100 cases. In 3rd Congress of the European Paediatric neurology Society. Nice. France. 1999 Nov 7-10. European Journal of Paediatric Neurology. 1999;3(6):A21(198)
8. V Wong, JG Sun, Q Ma, E Yang, CY Yeung, R Li. Tongue Acupuncture in Child Neurology Practice - a New Neurohabilitation model? Proceedings of the 2nd World Association of Chinese Epileptologists and Annual Scientific Meeting of the Hong Kong Neurological Society. Hong Kong. 1999 Dec 4-5
9. KK Wong, CT Leung, JG Sun, QY Ma, ES Yang, V Wong, R Li, X Ma. Correlation of Acupuncture Treatment and fMRI Response of Stroke. Proceedings of International Society of Magnetic Resonance Medicine, 2000 April 1-7, USA
10. JG Sun, V Wong, ES Yang, QY Ma. Functional Neuroimaging and Acupuncture. Proceedings of the 5th World Conference on Acupuncture (World Federation of Acupuncture Society). 2000 November 13-15, Seoul, Korea
11. V Wong, JG Sun, W Wong. Pilot Study of Efficacy of Tongue Acupuncture in Neurologically Disabled Children with Severe Drooling Problem. Proceedings of the 5th World Conference on Acupuncture (World Federation of Acupuncture Society). 2000 November 13-15, Seoul, Korea
12. V Wong, JG Sun, W Wong. Randomised Control Trial of Using Tongue Acupuncture in Children with Autistic Spectrum Disorder. Proceedings of The 5th World Conference on Acupuncture (World Federation of Acupuncture Society). 2000 November 13-15, Seoul, Korea
13. JG Sun, V Wong, QY Ma, PW Cheng. Pilot Study of the Use of Traditional Chinese Medicine (Tongue Acupuncture) in Patients with Stable Stroke. Proceedings of 13th Annual Scientific Meeting of the Hong Kong Neurological Society, 2000 November 18-19, Hong Kong.
14. V Wong. Chinese and Western Medicine - Conflicts and Compatibility. International Healthcare Conference (Healthcare in the Millennium). 2000 December 16-18, Hong Kong.
15. V Wong. Integration of Traditional Chinese Medicine (Tongue Acupuncture) in Neuroscience. Proceedings of International Healthcare Conference (Healthcare in the Millennium), 2000 December 16-18, Hong Kong (Plenary lecture)
16. V Wong, JG Sun, W Wong. Randomised Control Trial of Using Tongue Acupuncture in Children with Autistic Spectrum Disorder. Presented in 17th World Congress of Neurology London. 2001 June 17-22. (selected as one of the most innovative research for press release)
17. V Wong, JG Sun, W Wong. Randomised Control Trial of Using Tongue Acupuncture in Children with Autistic Spectrum Disorder. Journal of Neurological Science. 2001
18. JG Sun, V Wong, QY Ma, PW Cheng. Pilot Study of the Use of Traditional Chinese Medicine (Tongue Acupuncture) in Patients with Stable Stroke. Journal of Neurological Science. 2001
19. V Wong, JG Sun, W Wong. Pilot Study of Efficacy of Tongue Acupuncture in Neurologically Disabled Children with Severe Drooling Problem. Pediatric Neurology 2001; July; 25 (1): 47 - 54
20. V Wong, JG Sun, W Wong. Randomized Control Trial of Using Tongue Acupuncture in Children with Autistic Spectrum Disorder. Proceedings of 17th World Congress of Neurology (June 17-22, 2001, London, United Kingdom). Journal of the Neurological Sciences 2001;187 (Supp1):S329-330

21. V Wong. Pilot Study of the Use of Traditional Chinese Medicine (Tongue Acupuncture) in Patients with Stable Stroke. Proceedings of 17th World Congress of Neurology (June 17-22, 2001, London, United Kingdom). Journal of the Neurological Sciences 2001;187 (Supp1):S254
22. V Wong, JG Sun, QY Ma, E Yang. Tongue Acupuncture (TAC) in Child Neurology practice - A New Neurohabilitation Model? The 23rd International Congress of Pediatrics, Sept 9-14, 2001. Beijing, China. Symposium on Traditional Chinese Medicine, 0A-S8-2 (P 31)
23. P Ip, HK Ho, J Lee, V Wong. Environmental Mercury exposure in children with autism: a case control study. The 23rd International Congress of Pediatrics, Sept 9-14, 2001, Beijing, China. Symposium on Environmental Toxin, 4A-F3-4 (P 237)
24. V Wong, JG Sun, QY Ma, E Yang. Double Blind Randomized placebo-controlled Trial using Tongue Acupuncture in Children with Autistic Spectrum Disorder. The 4th European Paediatric Neurology Symposium (Sept 12-16, 2001, Baden-Baden, Germany); Symposium on Cognitive Disorders. European Journal of Neurology 2001, 5(5):A82:P189
25. V Wong, C Leung, A Sze. A pilot study of traditional herbal medicine (Gingo Biloba and Ginseng in two children with attention deficit hyperactivity disorder. The 4th European Paediatric Neurology Symposium (Sept 12-16, 2001, Baden-Baden, Germany); Symposium on Cognitive Disorders. European Journal of Neurology 2001, 5(5):A82:P354
26. V Wong. Tongue Acupuncture in Child Neurology Practice - a New Neurohabilitation Model? Proceedings of the 23rd International Congress of Pediatrics, Beijing, PRC. 2001 Sept 9-14
27. V Wong. Tongue Acupuncture in Children with Brain Disorders. Proceedings of the Symposium on Autism - the Way Ahead (2001 June 27, Hong Kong)
28. V Wong. Autistic Spectrum Disorder in children - any early signals? Hong Kong College of Physicians, Hong Kong College of Paediatricians, Hong Kong College of Pathologists. 2001 Oct 27.
29. V Wong. Tongue Acupuncture in Children with Brain Disorders. Proceedings of the 9th Symposium of International Child Neurology Association and 7th Asian Oceanian Association of Child Neurologist. Beijing. 2002 Sept 20-25. Brain & Development.
30. V Wong. Research on Tongue Acupuncture in Children with Autism. Proceedings of the 9th satellite Symposium of International Child Neurology Association and 7th Asian Oceanian Association of Child Neurologist. Hong Kong. 2002 Sept 18-19. Brain & Development.
31. D Yeung, V Wong, JG Sun. Effect of Tongue Acupuncture on Brain Metabolism in Autism Using Brain Positron Emission Tomography. Proceedings of the 9th satellite Symposium of International Child Neurology Association and 7th Asian Oceanian Association of Child Neurologist. Hong Kong. 2002 Sept 18-19. Brain & Development.

Acupuncture & Autism. For UK conference 2003 Sept 2,3